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East Europe Report

SCIENTIFIC AFFAIRS

No. 736

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INTERNATIONAL AFFAIRS

INTERNATIONAL TRANSFER OF TECHNICAL KNOW-HOW DISCUSSED

Warsaw SPRAWY MIEDZYNARODOWE in Polish No 6, Jun 81 pp 73-88

[Article by Dr Ryszard Rapacki, lecturer at the Faculty of Foreign Trade of the Main School of Planning and Statistics [SGPiS]: "International Transfer of Technical Know-How"]

[Excerpts] In traditional formulations, the international transfer of technology is widely considered as the sum of human, material and nonmaterial forms of a transmittal (carrier) of a good, independent of the degree of processing technical know-how and the role it plays in the production process.[1] Thus, it links somewhat artificially into qualitatively different categories and blurs the division between the different, separate fields of international economic relations.[2]

If one looks at the phenomenon of transforming technical know-how into an independent object of international trade through the prism of the wider process--the internationalization of production--then one must conclude that the international transfer of technical know-how is the product of a longer historical evolution and is an indication of the passage of the internationalization of a production process to a new, qualitatively higher phase. In this process, one can observe a logical line of development based on the gradual inclusion in international trade of increasingly more complex phases of manufacturing and also an increasingly wider scope of goods (and not just final goods) as well as the factors of production needed for their manufacture.[3] One of the latest indications of the internationalization of man's production activity is not the diffusion of individual goods or production factors from country to country but of entire areas and branches of production seeking the most advantageous operating conditions (so-called redeployment).

As with international trade, technical know-how occurs not--as previously--embodied in final products produced with its help or in the qualifications and experiences of people but independently--in a form coded with the aid of certain information symbols, conditioning the undertaking of specified production (patented inventions) or the know-how resulting from it.

Taking into consideration the new qualitative characteristics of the present phase of development of international economic relations, it appears desirable to differentiate between the international trade of technology in the traditional, widely accepted formulation (where conventionally most fields of international economic relations are generally accepted, such as the flow of capital and labor, the fraction of world trade and the like) and the transfer of technical know-how in the strict meaning of the word. In this second formulation the production function of technical know-how as an independent production factor, its specificity as a good of a nonmaterial character and its homogeneity as an "intellectual" good, not directly related either to material objects or to the qualifications and production experiences embodied in man, clearly stand apart.[4] Thus vanish the difficulties associated with separating the contribution of technical know-how from the value of materials and design--the production of which the know-how was used--as well as executing a similar operation to establish the role of science and "learning through doing" in the case of work force qualifications. As a result, only technical know-how in the pure form that is qualitatively homogeneous and occurs as an independent, unbound production factor is, strictly speaking, an object of transfer on an international scale. Most often it is transferred from country to country by means of licenses, part of which could consist of patented discoveries, usable designs or trademarks (patent licenses), and then again another part could consist of unpatented production experiences or production secrets associated with production set up, organization and the like (know-how license).

An international market for such a defined good differs greatly from markets for other goods (for example, investment goods) or factors of production (the market for "experts," the capital market) that are considered in a wider sense as a carrier of technical know-how transfer.

The designation "transfer of technology" is used universally, which implies a certain neutrality regarding the phenomenon of shifting technical know-how from one country to another, frequently of different sociopolitical systems, cultural traditions and the like. However, some authors concerned with this problem state that the transfer abroad of technical know-how is not neutral from the viewpoint of the effect on the new socioeconomic setting. In their opinion, foreign technology is an instrument for realizing the designated political and economic interests of the owner and also is a source for the transmittal of ideas, cultural and civilizing patterns, a hierarchy of values and consumption patterns that are not always beneficial to the societies and countries receiving the technology.[5] This (and not this alone) suggests that the word "transfer" be replaced by the concept of commercialization of technology, which would be more appropriate to the essence of these phenomena.[6] However, it seems that the problem depends not on onomastics alone (all the more so since the question of the commercialization of technology refers mainly to relations among countries that create a large technical and economic gap) but on properly interpreting and reading the essence of certain concepts and considering the phenomena in the economic policy associated with them.

One can look at the international transfer of technical know-how from still another point; that is, as a process wherein technical know-how is gradually diffused worldwide regardless of the form in which it is executed, the methods of legal regulation (for example, the existence or lack of patent rights in the case of know-how) and the subjects performing it. With such an approach this process represents the third element of the famous Schumpeter triad: invention--innovation--imitation.[7] New inventions and technical solutions are initially applied to production in one country (innovation), but after a certain period of time (known in the literature as imitative creep or the imitation gap) they are also disseminated in other countries.[8] This process is ordinarily called the diffusion of technical know-how or innovative imitation.[9]

Characteristics of International Transfer of Know-How

The international transfer of technology, identified with international license trade, ordinarily resolves itself into an aggregate of events (a tendency) occurring in the international license market.[10] This is not entirely accurate.

First, not all technical know-how that is the object of transfer is drawn into the orbit of market action. Certain of its elements can be transferred on non-commercial bases (for example, cross-licensing operations) or also gratuitously.[11] For this reason the statement is heard that the visible part of the international transfer of technology (that reflected in the financial data) represents a small percentage of total transactions (the so-called tip-of-the-iceberg theory).[12]

Second, transnational enterprises are the primary sources of supply and a significant part of the demand for technical know-how in international turnover.[13] As a result, a large portion of the flow of technical know-how is carried out within these enterprises (between the parent enterprise and its branches or among the branches themselves). Thus, the course of technical know-how, the level and structure of payments, the transaction conditions and many other variables defining the character of the international market for technology are to a great extent shaped by internal corporate decisions, which deform the structure of the market and change its character. It is not a free market; in large part it is controlled and manipulated according to the changing interests of a small number of enterprises. Thus, in this situation it would be more expedient to talk about a technical know-how market only with regard to that portion in which transactions are executed by independent enterprises.

With these stipulations, for greater convenience and simplification of considerations, one can still speak about the international trade of technical know-how in the sense of a market for this good. Concerning its shape and the fact that it differs quite substantially from markets for other goods, its attributes can be determined by the following:

1. It is closely associated with the market for investment goods and the market for the highly qualified work force. This results from the fact that the granting of licenses in general is a part of a bigger contract (for example, the sale of an entire installation) or that it also carries a concurrent flow of machinery and goods. In turn the startup of licensed production often requires the technical help of the license issuer, consulting services and the training of licensee personnel and the like.

2. It is an indistinct market divided by many institutional barriers (resulting from, among other things, the effects of the system to protect patent rights). As a result, it is highly imperfect and contains many elements of monopoly.

3. As the result of the existence of an owner's technical monopoly of protected technical designs that are especially potent, the bargaining position of a buyer in relation to the seller is much weaker than in the case of other, even the most monopolized, goods.[14]

4. With the seller's monopoly and the buyer's weak bargaining position is also associated the possibility of execution by that first segmentation of the market. As a consequence, the seller can establish in a highly discretionary way the cost of technical know-how, imposing disadvantageous conditions on a buyer for its purchase as well as differentiating it, depending on who is competing for the purchase.

5. The connections that arise between buyer and seller are, in general, of a longer lasting and more multilateral nature than with ordinary exchange transactions. They extend to the production sphere and at times even to research and development activities.

The Socialist Countries

Despite the significant increase in the purchase of licenses since the mid-1970's and the export of licenses on a limited scale, the role of the socialist countries in the international transfer of technology continues to be marginal, not corresponding to the achieved level of development, to the investment of research potentials or even to the index of share in other spheres of international economic relations. However, many authors believe that the participation of the socialist countries in world license trade is significantly less, but the license transactions executed within the framework of CEMA, some of which continues to be carried out on a noncost basis, are not taken into account.[42]

But even if this correction is considered, it should be emphasized that most license trade is carried out with developed capitalist countries.[43] During the 1960-1976 period, the socialist countries purchased about 2,200 licenses in the West (including 300 during the 1960-1965 period, 700 from 1966-1970 and 1,200 from 1971-1976), while exporting about 700 licenses.[44] In mid-1970, the average annual expenditure for this purpose was about $500 million while export revenues were $40 to 50 million.[45] The ratio of the value of licenses exported to those imported was more or less 1:10 to 12, and revenues from the export of licenses covered at most 10 percent of the expenditures for imports from this group of countries.

The USSR is the largest importer of licenses from the West; in the 1960's it transacted about 50 licensing agreements annually and in the 1970's, 100 licensing agreements. Outlays for these purposes amounted to $1,259 million during the 1966-1970 period--that is, an average of $250 million annually--and during the 1971-1975 period, about $300 million annually. Beside the USSR, the main purchasers of licenses from the capitalist countries were Poland, Czechoslovakia and the GDR. The order of the amount of purchases was about the same, but in the case of the GDR, after much effort during the 1960's, the import of licenses fell dramatically during the 1970's. During the 1966-1970 period, the GDR spent $455 million--that is, an average of $90 million annually--to purchase licenses but in the first half of the 1970's the scale of purchases decreased to $10 to $15 million annually.[46]

Table 4. License Turnover with the West for the CEMA Countries during the 1966-1979 Period (in millions of dollars)

1 Kraj	2 1966	3	1970		1977	
	Wpływy	Wydatki	Wpływy	Wydatki	Wpływy	Wydatki
4 Bulgaria	.	32,5	.	7,0	.	.
5 Czechosłowacja	0.8	3.9	9,2	46,7	16,1	63,5[a]
6 NRD	.	89,0[b]	2,0	15.0[c]	7,5	6,0
7 Polska	0,03	6,3	0,2	50,0	4,5	17,4
8 Rumunia	.	74.8[b]	.	.	.	.
9 Węgry	0,2[c]	0,9[d]	0,4	1.5	16,2[a]	47,6[a]
10 ZSRR	.	252,9[b]	.	300,0	.	300,0

11 a — 1976 r.
12 b — średnia roczna dla 5 lat
13 c — 1971 r.
14 d — 1968 r.
15 Źródło: Statystyki licencyjne poszczególnych krajów; *Licensing and Leasing. Committee on the Development of Trade. ECE.* Geneva 1976, s. 16; J. Maciejewicz: *Obroty licencyjne (...).*

Key:

1. Country
2. Revenues
3. Expenditures
4. Bulgaria
5. Czechoslovakia
6. GDR
7. Poland
8. Romania
9. Hungary
10. USSR
11. 1976
12. Annual average for 5 years
13. 1971
14. 1968
15. Sources: Licensing statistics for specific countries; "Licensing and Leasing," Committee on the Development of Trade, ECE, Geneva, 1976, p 16; J. Maciejewicz: "Licensing Turnovers (...).

By the end of the 1960's, Czechoslovakia purchased over 300 licenses; in the 1970's it imported an average of 50 licenses annually. At the same time, however, this country is the largest exporter of licenses in CEMA; up to the mid-1970's about 50 percent of the revenues from this entire grouping went to Czechoslovakia. Lately, Hungary has been achieving a similar level of export licensing. For these countries the ratio of revenues and import expenditures is about 1:4; that is, like some of the developed capitalist countries having the lowest degree of covering imports with income from the export of licenses.

Against this background, Poland's situation is especially unfavorable. During the entire postwar period (up to 1980) 136 licenses were sold abroad for $29.8 million and the ratio of export income to expenditures for license importation was 1:29. Export income did not exceed 4 percent of import expenditures.[47] Poland's share in the world export of licenses in 1976 was 0.06 percent, compared to 1.1 percent for the export of goods and 2.3 percent for industrial production.[48]

For comparison, it should be added that during a period of only 4 years (1979-1973) Czechoslovakia exported more licenses (179--worth $43.1 million) than Poland did during the entire 35-year postwar period.[49] As a result, the deficit in our license trade was over 2.4 billion foreign exchange zlotys (approximately $736 million) during the 1945-1978 period.[50]

The analysis of the trends in the international licensing market formally leads to several conclusions regarding the factors determining the position occupied by the socialist countries, especially Poland, in the international transfer of technical know-how. The question also arises: In view of overall world phenomena, what are the possibilities of improving this position?

A cursory observation shows that in the case of the socialist countries the factors determining the volume and structure of its license trade are different from those in the rest of the world market. Above all, because of the marginal significance of direct foreign investments in the development of these countries, the flow of production capital has not been a factor to date in initiating license transactions and shaping the intensity of the flow of license imports and exports.

Also, the linkage between license imports and exports of license-derived goods is, for many reasons, very weak. Some of the indexes concerning Poland illustrate this. The importation of licenses to Poland stiumlated export expansion only to a small extent; the tempo of growth of license export was lower than the dynamics of license production. As a result, the share of export in license production decreased from 43.8 percent in 1972 to 25 percent in 1978; the share of license export in total export was very low and in practice did not change during this time (6.2 percent in 1973 and 6.0 percent in 1978).[51] The lack of correlation between the import of licenses and the export of goods can also be traced to the negative balance in license exchanges in the 1970's (the full cost of importing licenses significantly increases income from the export of licensed products).[52]

In light of the experiences to date of the socialist countries, which show--with few exceptions--that the disproportions in the level of exports and imports of technical know-how are of a permanent, structural nature, it appears that the separate treatment of the causes explaining the relative "ease" of importing licenses and the limited volume of its export is justified.

In searching for these causes, it should be emphasized above all that the level-of-economic-development factor--a basic and universally acknowledged determinant of a country's position in the international transfer of technical know-how--does not represent for the socialist countries an adequate explanation of the causes of its great demand for the import of licenses or its inconsiderable capability to export licenses. This is attested to by the fact that many countries with market economies and an advanced level of development showed over a period of years greater demand for import of licenses as well as a capability for exporting them (Spain or Italy). Also, several Third-World countries (Brazil, Mexico and Argentina) imported much more technical know-how than the socialist countries (excluding the USSR).

Experience shows that in the socialist countries demand for the importation of technical know-how is above all a function of the centrally fixed level and structure of investments. At times it also is reinforced by the ease of access to foreign sources of financing development (for example, Poland during the 1971-1975 period). This demand can often be explained by the competition of economic organizations in the realm of unremunerative factors of production (especially investments and foreign exchange funds) typical for a command-distribution system of economic management. In this formulation, the submitted license inferences are not so much a reflection of actual need as they are above all an additional tool in the competitive battle permitting access to the central investment pool and overcoming recognized foreign exchange limits.[53]

The main cause of the small volume of exports of technical know-how from the socialist countries is the limited capacity of the economy to innovate, which in turn results from the improper system of functioning of the economy (except Yugoslavia and Hungary after 1968) that is historically shaped and is persistent.

If it is assumed that the present position of the socialist countries in the international market for licenses is in sum a reflection of their limited capability to create, use and disseminate technical innovations throughout the entire economy, which is an indication of the inefficiency of the existing system of economic management, then the answer to the question posed earlier about improving the position of the socialist countries (including Poland) as objects of international transfer of technical know-how is quite clear (even though the conclusions derived from it are not at all easy to realize).

Such an opportunity is being provided by the widely conceived, integrated economic reform that will improve the overall efficiency of the socialist economy. One of the main results of the reform should be to increase the capability of the economy to innovate and to undertake rationally development decisions. The reform should not only consider the inefficiencies and barriers existing within the economy but also take into account the wide scope of experiences of other countries and the trends in the world economy. Among other things, these experiences teach us that a prerequisite for improving Poland's position in the international transfer of technical know-how is, in addition to internal changes, the creation of mechanisms leading to the internationalization of the economy. In other words, the concern here is to create via autonomous enterprises conditions under which they would be interested in undertaking external expansion based on strict economic accounting. Undertaking the import or export of licenses under these conditions would be one form for a more extensive involvement in the international division of labor and opening the economy of the socialist countries from within.

NOTES

1. Among the most frequently mentioned forms of international transfer of technical know-how in the broad sense are 1) direct foreign investment and the undertaking of joint production and production-commercial ventures; 2) the sale of machinery and equipment; 3) the export of complete industrial installations (for example, the sale of so-called turnkey installations); 4) production as well as research and development cooperation; 5) licensing agreements; 6) provision of technical services; 7) the "export" of specialists; 8) the training of technical cadres; 9) the exchange of publications and the sale of technical documentation; and 10) the participation in international scientific conferences, meetings and symposia of a general and specialized nature. For example, see "Guidelines for the Study of the Transfer of Technology to Developing Countries," UNCTAD document TD/B/AC.11/9.

2. For example, the export of machinery and equipment as well as complete installations, treated in such a formulation as a form of transfer of technical know-how, is at the same time a component of international trade.

3. As a result of the intensification of the international division of labor, the burden of specialization of production has shifted from the international to the intrabranch level, its present object is to supply parts and subassemblies for final assemblies.

4. For more on the subject of the specific characteristics of technical know-how, see the article by R. Rapacki "The Specific Character of Technical Know-How as a Good," PROBLEMY EKONOMICZNE, No 4, 1981.

5. Regarding the theory linking the international transfer of technology (mainly by transnational corporations) with changes in the consciousness of the people in the receiving countries, see K. Kumar, "A Working Paper on the Social and Cultural Impact of Transnational Enterprises," Honolulu, 1978; J. Cieslik, "The Influence of Transnational Corporations on Changes in Social Consciousness in the Developed Countries," SPRAWY MIEDZYNARODOWE, No 4, 1979; and R. Rapacki, "The Activities of Transnational Corporations and the 'Invisible' Dependence of Latin America," GOSPODARKA PLANOWA, No 3, 1980.

6. C.V. Vallos, "The Process of Commercialization of Technology in the Andean Pact," Lima, 1971.

7. Compare J. Schumpeter: "The Theory of Economic Development," Warsaw, 1960.

8. See L. Nasbeth, G.G. Lee (ed): "The Diffusion of New Industrial Processes on an International Scale," Cambridge, 1974; P.L. Swan, "International Diffusion of an Innovation," THE JOURNAL OF INDUSTRIAL ECONOMICS, Sep 1973.

9. Compare Th. Levitt: "Innovative Immitation," HARVARD BUSINESS REVIEW, Sep-Oct 1966.

10. For the sake of accuracy, international license trade should be broadened to include the exchange of documentation, which, however, often is an inseparable part of license transactions.

11. All license exchanges among the CEMA countries were of such a nature up to 1970.

12. Compare Ch. Cooper, Ch. Freeman and R. Turckean;, "Transfer of Technology," UNCTAD document TD/28.

13. According to some opinions, transnational corporations execute over one-half of the world trade via licenses. See J. Monkiewicz, "Characteristics of the International License Market," SPRAWY MIEDZYNARODOWE, No 4, 1980.

14. For more on the substance of the monopoly of technology and its resulting consequences, see C.V. Voltos, "Transfer of Resources and Preservation of Monopoly Rents," paper presented to Dubrovnik Conference of Harvard, 1970.

42. See J. Monkiewicz, "Characteristics of International Market....

43. For example, of the 624 licenses purchased by Poland during the 1945-1973 period, 42 (or 6.7 percent) were from the socialist countries. During the 1971-1978 period this share was somewhat larger and amounted to 8.8 percent (432 and 38 licenses respectively). The author's own calculations are based on the CIHZ Central License Register.

44. J. Wilczynski, "Licenses in the East-West Transfer of Technology." JOURNAL OF WORLD TRADE LAW, No 2, 1977.

45. J. Wilczynski, "Multinationals and the East-West... pp 70, 75.

46. Compare J. Maciejewicz, "License Trade between CEMA and the West," RYNKI ZAGRANICZNE, No 138, 1980.

47. See R. Rapacki: "Poland's Export of Licenses," ZYCIE GOSPODARCZE, No 21, 1980.

48. Author's calculations and ROCZNIK STATYSTYCZNY 1980, Warsaw, 1980.

49. "Licensing and Leasing," Committee on the Development of Trade, ECE, Geneva, p 16.

50. Author's calculations based on Main Office for Statistics [GUS] data.

51. The index of the share of total export does not take into account the exportation of terminated licenses; If it were taken into account, the index would be somewhat higher; for example, it would have been 7.6 percent for 1978.

52. During the 1973-1978 period, costs for license payments as well as for supply, cooperative and investment imports for licensed production greatly exceeded income from the export of licensed production in toto as well as in relations with the developed capitalist countries. The extent to which expenditures were covered by income for the specified years was respectively: 107.0 percent, 88.1 percent, 70.0 percent, 55.0 percent, 65.6 percent and 99.2 percent; relative to the capitalist countries it was 46.6 percent, 43.6 percent, 37.9 percent, 37.6 percent, 39.1 percent and 54.9 percent. Author's own calculations are based on GUS data.

53. Compare R. Rapacki, "Factors Designating the Demand for Foreign Technology in a Socialist Economy," GOSPODARKA PLANOWA, No 6, 1980.

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CEMA MACHINE TRANSLATION SUCCESSES OUTLINED

Prague ZEMEDELSKE NOVINY in Czech 17 Feb 82 pp 1, 4

[Article by Jan Subert: "Machine as a Translator--Charles' University Coordinates Research by CEMA Countries"]

> [Text] Specialists studying information problems point out that of the deluge of scientific and technical studies, reports and treaties flooding the contemporary world almost one-half can be "written off" as they will never be read by anyone. No wonder. If the first periodical for scientists was published 300 years ago, today there appear more than 3 million discourses annually in the field of natural sciences alone. And, if we take into account the language barriers, we stand face to face with the risk of an "informational collapse" which could become a serious impediment continued social development. The possibilities for averting this threat are several, among them the technique of automated machine translation. In some advanced countries these systems are already at work and, as we found out, even we are not lagging far behind.

Everybody who in his work needs to know what is happening in his field worldwide is very much aware of it. One or two languages can be handled fairly easily, in a third one we do a lot of guesswork and for a fourth and fifth one we must look hard to find somebody to translate the interesting text. And that is precisely the moment when the thought occurs to us: we orbit through space, smash atoms, but to have somebody invent an electronic translator is one thing we have not managed to accomplish as yet.

Wrong! Almost 30 years have passed since the birth of the first translator not made of flesh, blood and bones!

It all happened at the moment when automatic computers made their appearance on the technological horizon. Their memory, combinational capabilities and great speed of "thinking" left no doubt in the mind of some experts that for the first time in history we have at our disposal a means which could effectively cope with the Babel of tongues of our world. And starting with 1954, the U.S. and USSR began to implement for first experiments.

"Of course, the initial experiments were limited to mere translation of one word after another, without any substantial grammatical analysis. However, many researches soon realized that programs for machine translation must be based on a linguistic processing system. Among the pioneering studies in 'grammatical' translation belongs, e.g., the experiments of Soviet scientists led by O S Kulagina, who even at the outset of the sixties conducted verification studies with translation of French into Russian."

These words were the start of our recent meeting with docent Petr Sgall, PhD, DrSc, who heads a team of linguists dealing with the problems of machine translation at the School of Mathematics and Physics of the Charles University in Prague. For example, very few people know that the first successful attempt took place in Prague as early as 1960 with the use of the Czechoslovak SAPO computer which translated English text into Czech. And it is also relatively little known that Docent Sgall's team recently experimentally tested a system that in time will be used by one of our industrial research organizations.

Docent Sgall: "An alert reader is sure to wonder about the 20-year gap between the successful attempt of 1960 and the current--relatively very late--preparations for practical application. It must be said that it was caused by the worldwide skeptical attitude that started to surround machine translation in the early sixties. First of all it turned out that the computer programs compiled on the basis of linguistic analyses would be too complex to be adequately handled by the operational speeds of the then contemporary computers. Pessimism was reinforced also by the pronouncements of some logicians pointing out that the structure of individual elements of language has not yet received adequate scientific description in linguistics. The conclusion was a statement that it is more realistic to improve teaching of languages than to count on the possibility of machine translation. That opinion prevailed for a very long time and we did not return to automated translation until the mid-seventies."

The 11-member team of the School of Mathematics and Physics of the Charles University uses the large Soviet EC 1040 computer which is installed in the building of the university computer center in Prague at Malostransky Square. The complex program prepared for this computer by the mentioned team of linquists, mathematicians, logicians and programmers contains hundreds of grammatical rules and facilitiates reliable machine translation of English texts from the field of electronics.

"Development of machine translation, as a task of the state information policy, is coordinated by the Center of Scientific and Technical Information," explains Docent Sgall and continues. "One of the first to show interest in the results of our efforts was the Research Institute of the Sigma plant in Olomouc, specializing in the field of pumps. According to the agreement which we are negotiating with the institute, Sigma will first implement a translation search system--on the basis of a requirement written in Czech the computer will provide a response referring to relevant literature written in English."

Among the several countries where machine translation is already in use, the leading position is held--thanks to its bilingual status--by Canada. For instance, since 1976 there has been in operation a system translating from English to French all reports of the Canadian meteorological service. It operates at a speed of 1,000 words per minute.

In the Soviet Union there is in operation a system based on an extensive statistical processing of the text and simple grammatical rules; several grammatically very well-thought-out systems are in preparation.

A high-quality system translating from Russian and English has been operating at the university of Grenoble in France and it is interesting to note that so far it has translated over 1 million words from Russian.

As we were further informed, automated translation of foreign-language texts is the subject of joint research by CEMA countries. An important position in that program is held by, e.g., the Laboratory of Machine Translation at the Moscow State Pedagogical Institute of Foreign Languages headed by Professor Rozentsveyg, a department of the Central Institute of Linguistics in Berlin headed by Professor Kunz and other workshops in Moscow, Novosibirsk, Leipzig, Warsaw and Sofia. And it is no mere accident that this entire research is coordinated by Charles University.

Docent Sgall: "We are convinced that machine translation will make it possible for researchers and designers to orientate themselves rapidly and easily in the linguistic maze of the current worldwide information explosion. At the same time, it will provide a solution to the shortage of qualified translators of technical literature. It will not be long before machine translations are cheapter than traditional translations. It can also be expected that further improved automated systems will also find application in published texts and reports."

Experts at the School of Mathematics and Physics in Prague, who in the framework of the Chair of Applied Mathematics introduced to the world the first Czechoslovak system of machine translation capable of finding practical application, point out that its wider distribution is for the time being contingent on show of interest by potential users. If it is expressed, it will be possible to prepare a program for translation of German and French texts, too, and expand it to other technical fields. And that certainly is an offer which our institutes and research centers should not ponder over for long.

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CSO: 2402/32

NEW ECONOMIC UNIT TO BOOST FARM EQUIPMENT PRODUCTION

Prague SVET HOSPODARSTVI in Czech 12 Jan 82 p 3

[Article: "Organizational Changes in Agricultural Machinery Production"]

> [Text] A new economic production unit [VHJ] for agricultural machinery production with the designation Agrozet Brno was established as of 1 January 1982 under the jurisdiction of the Federal Ministry of Machine Building on the basis of the resolution of the Presidium of CSSR Government regarding reinforcement of the technological base of agricultural machinery production of 22 October 1981.

The basis of the new VHJ Agrozet Brno is formed by the present VHJ Munitions Plant Brno expanded by incorporation of additional production capacities. The latter include primarily the Roudnice Machine Building Plant and Foundry in Roudnice on the Elbe River, the VHJ Czechoslovak Automobile Works in Prague and the Agra plant in Rozmital of the Nonferrous Metal Ore Mines national enterprise [n.p.] in Pribram. Transferred from under the jurisdiction of the SSR Ministry of Agriculture and Food is the Velke Mezirici branch of the Machine Building Plant n.p. of the Procurement Enterprises in Bratislava, from under the jurisdiction of the CSR Ministry of Agriculture and Food are the Agricultural Machinery Repair Shops [OZS] of the OZS n.p. in Dasice, the Machine Tractor Station [STS] in Roudnice on the Elbe River, the STS Center in Jicin of the STS n.p. in Horice and the STS Center in Kamenice on the Lipa River of the STS n.p. in Pacov. The designation general management of the Munitions Plant is changed to Agrozet Brno, general management.

Establishment of the new VHJ for agricultural machinery production will create the prerequisites for improved meeting of the demands of Czechoslovak agriculture and of foreign trade for agricultural equipment.

The production base of the new VHJ for agricultural machinery production will expand by approximately 3,000 personnel. A substantial part of the latter are already active in production of farm equipment--be it final products or cooperative deliveries for agricultural machinery plants. However, in the key new organizations--the Roudnice Machine Building Plant and Foundry n.p. in Roudnice on the Elbe River and the plant in Rozmital--a considerable part of production capacities is taken up by other production programs that will gradually have to be turned over to other manufacturers.

The new capacities will contribute by orientation of their production programs toward meeting the pressing needs of Czechoslovak agriculture by the requisite equipment, and by stepping up its production will create the prerequisites for increased intensification of agricultural production in the CSSR. In keeping with the resolutions of the 16th Congress and the Fourth Plenum of the CPCZ Central Committee of October 1981, it was decided to use the newly obtained capacities primarily for stepping up the production and deliveries of machinery and equipment for soil cultivation and sowing, for production of bulk fodders, to include machinery for mechanization of fodder grass processing in foothill areas of mountains, for mechanization of horned cattle keeping and, partially, also for providing small keepers and breeders with the necessary equipment. This end is also served by the organizational structure of the newly obtained capacities and the concept of their utilization:

Operations of the STS in Roudnice on the Elbe River will be incorporated into those of the Roudnice Machine Building Plant and Foundry n.p. in Roudnice on the Elbe River. The plant will step up its ongoing production program for machinery used in soil cultivation and sowing of grain and cereals. Substantial increases in their production will call for, among other things, transfer of the plant's nonagricultural production programs as well as adaptation and modernization of production areas and equipment after their transfer. A systematic implementation of these goals is expected by 1985 to double production for the agricultural sector in comparison to 1980.

Consistent with the needs of Czechoslovak agriculture, most of the newly acquired capacities are oriented toward production of mechanization means for horned cattle keeping, to include machinery for increased production of bulk fodders.

Incorporation of the Nonferrous Mines plant in Rozmital, the STS Center in Kamenice on the Lipa River and the Velke Mezirici branch of the Machine Building Plant of the Purchasing Enterprises in Bratislava into the Agrostroj n.p. in Pelhrimov will increase the latter's manpower by 23 percent. In addition to the main plant in Pelhrimov, it has seven additional branch plants and workshops. This capacity will be used for production of mechanization means for cultivation and harvesting of bulk fodders from arable land and pastures, including those in foothill and mountain regions. For supplanting the production lines of dairy farms, the plant continues its production of milking lines, milking equipment and other specialized products and also continues its production of the sought-after stable manure spreaders.

Incorporation of the OZS plant in Jirikov will also reinforce the production base of the Agra n.p. in Prelouc which is a supplier of complete technological systems for the development and modernization of horned cattle keeping. This includes primarily deliveries of systems for keeping of calves, fattening of steers and modernization, or eventual new construction, of farms for milch cows. Agra will also use the acquired capacities for the required production of standardized haylage facilities and solar collectors.

Agrostroj in Jicin is a plant specializing primarily in the production of operational systems for cultivation and harvesting of sugar beets, but its production program also includes so-called small-scale mechanization equipment--MF motorized harvesting machines and Terra small tractors which are needed, among other uses, for intensification of agricultural production by small keepers and breeders. Incorporation of the STS Center in Jicin into Agrostroj Jicin will also improve conditions for the development of both of these machine building sectors. To boost the production of the equally needed small tractors, Agrostroj Prostejov is building a branch in Roznava.

Expansion of the production base of agricultural machinery production in the new VHJ Agrozet Brno also brings about improved conditions for utilization of its research and development base and for faster implementation of research and development findings.

Thus, since the beginning of 1982 the new VHJ Agrozet Brno includes a total of 15 organizations, 10 of them production plants--Zetor Brno, Precision Machinery Uhersky Brod, Agrostroj in Prostejov, Pelhrimov and Jicin, the Roudnice Machine Building Plant and Foundry in Roudnice on the Elbe River, Letostroj Letovice, the Humpolec Machine Building Plant in Humpolec, Brnosmalt Brno and Mars Svratka--and five specialized organizations: the Research Institute for Agricultural Machinery in Prague-Chodov (the Research Institute for Tractors is organizationally incorporated into the Zetor Brno n.p.), the Central Enterprise for Agricultural Technology Brno, Agrotechnika Zvolen, Agra Prelouc and the newly established Agrotes Brno agricultural services enterprise.

The VHJ Agrozet Brno with its production plants and specialized organizations is the largest, but not the only, producer of agricultural equipment in the CSSR. Mechanization means for agriculture are also produced by the VHJ Heavy Machinery Plant in Martin, VHJ Czech Automobile Plant Prague, VHJ Chepos Brno, VHJ Sigma Olomouc, the Vitkovice concern enterprise, the Ironworks and Metallurgical Plant of Klement Gottwald and other smaller manufacturers. Agricultural equipment costing in excess of Kcs 12 billion (machinery and equipment for production of produce, fruit, wine, needed equipment from small-series production, etc) is to be produced for the CSSR in the course of the Seventh Five-Year Plan also by the VHJ STS and OZS in Vinor and in Rovinka and other agricultural organizations and other sectors not engaged in machine building.

Further intensification of Czechoslovak agriculture and improved providing for its needs will be also promoted by implementation of the program for the direly needed redesign and modernization of the extant production capacities of the former Munitions Plant VHJ. The program is linked to the development of new agricultural means of mechanization which will be introduced into serial production at the conclusion of the current and the beginning of the new five-year plan in keeping with the Czechoslovak system of agricultural equipment in accordance to the needs of international cooperation of CEMA countries as well as Czechoslovak foreign trade.

As has been emphasized in the report of the Presidium of the CPCZ Central Committee, read at the Fourth Plenum of CPCZ Central Committee by Comrade Pitra, secretary of the CPCZ Central Committee, the essential prerequisite for gradual solution of problems in mechanization of our agriculture is close collaboration and cooperation of the new agricultural machinery VHJ with agricultural enterprises, STS and other plants in the machine building sector. An agreement regarding a long-term program of cooperation designed to provide for the Czechoslovak system of agricultural means of mechanization, deliveries of complete mechanized lines, further expansion of recycling of spare parts and increasing their share of production has already been negotiated with both VHJ STS and OZS (OPS) in Vinor and in Rovinka. The agricultural machinery VHJ also cooperates closely with its partners in agriculture on introduction of a new system for delivery of replacement parts, being checked out in the Vyskov and Nitra districts, and in other areas of mutual relations among producers, suppliers and users of agricultural equipment. The decisive prerequisite for introduction of this system is renewal, combined with expanding the capacity of the computer system of the marketing network of the new Agrozet VHJ by the EC 1055 system in 1983.

The report of the presidium of the CPCZ Central Committee at its Fourth Plenum also contains the requirement for gradual development and expansion of the production base of the new agricultural machinery VHJ. From this viewpoint, the accomplished transfer of seven organizations and organizational units into the new Agrozet Brno VHJ represents a decisive step toward dealing with the former dissipation of efforts in the production base for agricultural machinery in the CSSR.

8204
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INTERFERON RESEARCH, PRODUCTION PROGRESSING

Budapest MAGYAR HIRLAP in Hungarian 27 Feb 82 [supplement p 8]

[Excerpts] Hungarian interferon research began officially in 1963 at Szeged Medical University. By 1974, research findings were described in the literature by Mrs Bela Olah, professor, head of the Szeged university team working in this field.

Research is also in progress in the Soviet Union and Yugoslavia. For the past 2 years Yugoslavia has been producing the equivalent of 60 percent of Finnish output and using it on patients in the form of suppositories and ointments. In these forms less of the active ingredient is required.

The high cost of interferon was drastically reduced in 1980 when Charles Weissmann of Zurich succeeded in preparing human interferon through genetic engineering. When made with use of bacterial cultures, interferon yields are as high as 1 milligram per 1 liter of culture.

Production of interferon is finally about to begin in Hungary. EGYT [United Pharmaceutical and Nutriment Factory] took note of the continuing experimentation at Szeged. However, the white blood cells received from the university blood donor center were insufficient for satisfying demand in excess of laboratory use. Now EGYT is establishing an association for promoting interferon research and production with the Institute of Microbiology of Szeged University and the National Institute of Haematology and Blood Transfusion. According to Istvan Bihari, executive director of EGYT, the factory's 200 million [forint?] investment is only a few weeks behind schedule, and the installations purchased from the West will become operational in March of this year. It is estimated that 400 billion units of interferon will be prepared. One ampoule contains 1 million units. Although the initial product will not be entirely pure, experimentation is expected to improve purity by the second half year making the product suitable for clinical testing.

This year only alfa interferon will be made, but next year the gamma type will also be prepared. The product will be exported to American and West European firms which have made inquiries. Although valid contracts do not exist yet, the goal is to export interferon worth several million dollars in 1983-1984. As soon as clinical testing is approved, certain Hungarian institutes will also be supplied with the quantities required.

Possibility for producing interferon through genetic engineering exists at the Biological Center in Szeged where this technique has a tradition of several years and has produced notable results. So far the small group working there has been unable to consider interferon production through genetic engineering for lack of financial support. At present they are using the technique to produce insulin.

CSO: 2502/54

HUNGARY

BRIEFS

MICROPROCESSOR CONFERENCE--A two-day conference on domestic use of microprocessors and PLCs [programable logic controls] has been convened at headquarters of the MTESZ[Federation of [illegible]chnical and Scientific Associations]. Its purpose is for teachers, researc[illegible], developers, producers and consumers involved with use of up-to-date technology to exchange experiences, report results and debate possibilities for progress. Several speakers have emphasized the importance of special training. Use of microprocessors and PLCs has been taught for only a few years at institutions of technical education. At present special courses are being offered at Budapest Technical University within the framework of the continuing education program in engineering. Furthermore, 15 industrial enterprises have recently established a joint applications technology service. They stressed that although Hungary is expanding production of apparatus involving microprocessors, the technology should be adopted throughout industry as soon as possible. [Budapest MAGYAR NEMZET in Hungarian 2 Mar 82 p 3]

CSO: 2502/55

1/f NOISE OF RESISTORS WITH GRAINY STRUCTURE

Budapest FINOMMECHANIKA MIKROTECHNIKA in Hungarian Vol 20 No 11, Nov 81 pp 321-322

AMBROZY, ANDRAS, Dr, professor, department of Electronic Technology, BME [Budapest Technical University]

[Abstract] The 1/f noise (where f denotes the test frequency) of thick-layer resistors (the presently most often encountered resistors with grainy structure) was investigated theoretically with the aid of mathematical models in a number of publications. The author summarizes these publications. The effect of current fluctuations is relatively easy to explain. It is caused by fluctuations of conductivity. However, no really satisfactory explanation has been developed for the frequency dependence, which is evident over the entire frequency range, even at frequencies of one millionth of a Hz. According to recent views, the noise output in thick-layer resistors is directly proportional to the square of the DC current flowing through the device and inversely proportional to the resistivity. Various structural models were proposed for specific resistors, for example solid-state barium(strontium) titanate. Figures 2, references 10: 2 German, 1 Hungarian, and 7 Western.

2542
CSO: 2502/44

DESIGNING AND MASK PROGRAMMING OF EIGHT KILOBYTE MASK-PROGRAMMED ROM'S

Budapest HIRADASTECHNIKA in Hungarian Vol 32 No 10, 1981 pp 365-368

ASZTALOS, ANDRAS, graduate electrical engineer, scientific group leader, and FARKAS, GABOR, Dr, graduate electrical engineer, staff scientist, Research Institute of the Communications Technology Industry

[Abstract] In their paper delivered at the 17 September 1980 TKI [Telecommunication Research Institute] Youth Conference, the authors discussed the designing and mask-programming of 8-kbyte mask-programmed ROM's [read-only memories] featuring n-channel, silicon control-electrode MOS technology, where the threshold potential difference of the transistors is achieved with the aid of a block-direction voltage connected between the source and the bulk electrodes. The data required for circuit design are obtained from the specification sheets of the devices and by measurements. In the example discussed, circuits of Intel Type 2308/8308 were employed. These data are then processed to obtain the block diagram, the logical connections, the electrical circuitry (using the cells available and sequential analyses), and the layout design. This can be carried out with the ANAL 20 program of the TKI AUTER system. Such procedures are currently used in actual practice for preparing the memory pattern of the control tapes of the ICOMAT-2 measuring automaton and the ICOMAT-110. The computer-aided procedures are illustrated with block diagrams and flow charts. Figures 5.

2542
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METHODS FOR MEASURING THE RELIABILITY OF INTEGRATED CIRCUITS AND COMPUTER-AIDED EVALUATION OF THE RESULTS OF THE MEASUREMENTS

Budapest HIRADASTECHNIKA in Hungarian Vol 32 No 10, 1981, pp 361-364

DROTOS, LASZLO, graduate electrical engineer, staff scientist, and VARADI, ISTVAN, graduate electrical engineer, scientific group leader, HIKI [Research Institute of the Communications Technology Industry]

[Abstract] In their paper delivered at the 17 September 1980 TKI [Telecommunication Research Institute] Youth Conference, the authors described the reliability-measuring methods used for integrated circuits, the use of computers to assist in these measurements, and the evaluation of their results, and illustrate the theoretical discussion with two examples involving the reliability testing of two TTL MSI integrated circuit types. The two integrated circuits are of Texas Types SN74142N and SN74191N. The computer processing of the tests (involving high-temperature storage, electrical load-resistance testing, performance under static and dynamic loads, etc.) involves compression and transfer of the data obtained on punched tape to magnetic tape, updating and correcting of the data, statistical processing of the corrected data, and derivation of the reliability characteristics. A flow chart illustrates the procedures used. The results of the tests performed are presented in tabular form, to illustrate the information that can be obtained by means of the procedures described. Tables 3, figures 2, references 3: 1 Hungarian and 2 Western.

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THE LINE OF INTELLIGENT VIDEO TERMINALS FROM THE VIDEOTON ENTERPRISE

Budapest HIRADASTECHNIKA in Hungarian Vol 32 No 10, 1981 pp 376-380

HADREVI, ISTVAN, graduate electrical engineer, Videoton

[Abstract] A brief description is given of the intelligent video terminals manufactured by Videoton. The VDDS (Videoton Data Display Station) family features circuitry of high integration and a bus system, with the connectors formed directly on the NYAK boards, resulting in a significant reduction of internal connections and connectors required. Synchronous version, asynchronous version, and asynchronous version with cassette are available. The individual models are versatile, expansible, and can display any alphanumeric character, and special graphic and line diagrams. Microprogrammed text editing, data transmission, periphery handling, and the like make these terminals suitable for a wide variety of uses. When operated in the enquiry mode, they permit the operator ready access to the files of the central processor. When operated in the data-entry mode, they replace conventional card-punching equipment, and can be used for file actualization and on-line data recording. The VT-20 system, developed from the basic VDDS family, has added memory capacity, screen controller, alphanumeric keyboard, INTEL 8080A micrprocessor, 64 kbyte memory, matrix or line printer, asynchronous or synchronous data path and a VT-20 software system (operating system, source-text editor, assembler, dynamic data-base handler, BASIC interpreter, and test programs). The VDT alphanumeric video terminal family is designed to be an operator-central processor interface in computer systems. The terminals are of modular design, comprising the following autonomous components: display with monitor, keyboard, and line interfaces. The SZM 7219 and the VSD 47703 terminals, described in some detail, are typical members of this family of products.

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ELECTRONICS AND ELECTRICAL ENGINEERING HUNGARY

THE CONCURRENT PASCAL PROGRAMMING LANGUAGE AND ITS POSSIBLE APPLICATIONS

Budapest INFORMACIO ELEKTRONIA in Hungarian Vol 16 No 6, 1981 pp 309-318
manuscript received 17 Jul 81

KACSUK, PETER, and GROF, JOZSEF, Videoton Development Institute

[Abstract] This article describes the high-level programming language, called Concurrent Pascal, for the designing of operating systems. The original Pascal language supports only the writing of sequential programs. The Concurrent Pascal — a modification of Pascal, making it suitable for concurrent programming, developed by Brinch Hansen (IEEE SOFTWARE ENGINEERING, June 1975 pp 199-207) — contains means for writing concurrent programs. It uses the data types, variables, and commands of Pascal but allows concurrent programming by introduction of means for handling cooperating and(or) competing processes. The primany features of Concurrent Pascal are assignment of the variables bebelonging to the individual processes, and a translator program checking whether these so-called private variables indeed reach the assigned process, and only that process. The Concurrent Pascal separates the cooperating sequential processes in a structured manner; is structured of access privileges, private data fields, and sequential program; ensures that only the declarative process reaches the data structure; and has an active operating mechanism. The original Concurrent Pascal was realized on a PDP11/45 computer. The practical use of Concurrent Pascal is illustraded by an example involving an airline seat-reservation system. It is recommended that Hungarian microcomputer developers and users make increased use of Concurrent Pascal to benefit from its compactness, modularity, and easy documentability. Figures 3, tables 2, references 11: 1 German and 10 Western.

2542
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COMPUTER-AIDED DESIGNING OF THICK-LAYER HYBRID INTEGRATED CIRCUITS

Budapest FINOMMECHANIKA MIKROTECHNIKA in Hungarian Vol 20 No 11, Nov 81
pp 334-340

KIESNAST, WOLDEMAR, Dr, professor, scientific department head, and BURKHARDT, WINFRID, Dr, staff scientist, Institute of Information Science and Theoretical Electrical Sciences, Technical University, Ilmenau, GDR; RIPKA, GABOR, Dr, associate professor, and Mrs RECZEY, GUSZTAV, assistant professor, Department of Electronic Technology, BME [Budapest Technical University]

[Abstract] The program system developed at Ilmenau Technical University for computer-aided designing of thick-layer hybrid integrated circuits is described and illustrated with flowcharts, graphs, diagrams, and drawings. The article also describes a program system developed for the same purpose at BME, the documentation obtained, and the actual manufacture. The GDR system uses an ODRA 1204 computer and a Type I ADMAP digital drawing device; the Hungarian system uses a HP 9810 benchtop calculator. The designing of the integrated components and the entries in the hybrid-device data bank, manual design of the topology, the completion of data forms, the preparation of data tapes, the entry of the topological data in the cassette, the methods used to improve or redesign the circuitry, and the documentation obtained are described. Both program systems significantly reduce the designing time, minimize manual work, and produce a punched tape that can be directly used for the preparation of enlarged drawings. Additional program routines (data-tape read-in program with the aid of which the topological drawing can be transferred directly to the drawing digitalizer, and a program for preparing a control tape for the Soviet-made EM 549 pattern generator) were also developed.
Figures 8, references 7: 5 German, 1 Hungarian, and 1 Western.

2542
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COMPUTER-AIDED DESIGNING, MANUFACTURING, AND CHECKING SYSTEM (TGE) OF PRINTED CIRCUITS AND SUBSYSTEMS ASSEMBLED FROM THEM IN THE TELEPHONE FACTORY (PART I)

Budapest HIRADASTECHNIKA in Hungarian Vol 32 No 10, 1981 pp 381-386

KOVACS, ANTAL, graduate mechanical engineer, graduate economics engineer, department head; PAL, IMRE, graduate mechanical engineer, graduate economics engineer, group leader; and HORVATH, JANOS, graduate electrical engineer, graduate economics engineer, group leader; TERTA [Telephone Factory], Budapest

[Abstract] This first part of a series of articles describes the goal of the TGE system, which was designed with the following goals in mind: improving product quality; reducing the manufacturing time; reducing the need for qualified staff; standardizing design, parts use, manufacturing technology, and documentation; increasing productivity; improving the competitiveness of the enterprise; and obtaining various other advantages. The designing system, documentation-generating system, circuit designing, manual design assistance and documentation generation, and computer-aided design assistance and documentation generation are briefly described in this part of the series. Among the equipment used are the following: Benson Type 1202 drawing machine and VT line printer, Ferranti Freescan System 4 digitalizer, and Ferranti-Cetec Graphics Ltd. EP 430 drawing machine. The basic units of the software configuration are: DOS-RV operating system, ANAL-24 program packet for AC analysis of linear networks, the ANAL-17 program packet for simulation of digital circuits, the KONSTR-M program packet for layout and wiring of printed circuit boards, the KONSTR-3-F program packet for handling digitalized printer circuits, the TECHN-T program packet for technological processing of printer circuits, and the UNIVIC and UNIVAX programs for generating the data carriers for automatic wiring machines for printed circuits. Flowcharts and photographs are shown to illustrate the operations described. Figures 6.

2542
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LATEST ACHIEVEMENTS IN DISTORTION MEASUREMENT WITHOUT FILTERS

Budapest HIRADASTECHNIKA in Hungarian Vol 32 No 12, 1981 pp 452-455

KOVACS, PAL, graduate electrical engineer, Institute of Communications-Technology Electronics, BME [Budapest Technical University]

[Abstract] Theoretical and experimental studies were carried out to realize an automatic distortion-measuring instrument of high resolution, which derives the harmonic distortion factors required in practice from the amplitude distribution values of the output signal of the system without the use of filters. The mathematical foundation of the principle employed is based on the nonlinear transformation of the amplitude distribution functions. Some simplifying conditions were introduced and means for selecting the test points were developed. The studies also covered the relationship between the amplitude distribution parameters and the harmonic distortion factors, and the resolution and measuring time. The block diagram of the realized instrument was presented. The equipment may be used for sinusoidal or Gaussian signal distribution. The Research Institute of the Postal Service commissioned the assembly of an operating instrument for measuring the distortion of a signal having Gaussian amplitude distribution (the signal to be tested at a resolution of 0.1 percent is in the 20 Hz to 20 kHz range). A version of this instrument for measuring the distortion of a signal having sinusoidal amplitude distribution is under preparation. Figures 4, references 4: 3 Hungarian and 1 German.

2542
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PROGRAMMING OF CONCURRENT SYSTEMS

Budapest INFORMACIO ELEKTRONIKA in Hungarian Vol 16 No 6, 1981 pp 304-308
manuscript received 18 Nov 80

NACSA, SANDOR, department head, SZAMOK [Computer Technology Educational Center]

[Abstract] The author surveys the special problems encountered in the programming of systems of the concurrent principle, and discusses briefly the means available for generating and using the problem-solving algorithms. Concurrent programming — which has now become a reality as a result of explosive growth of hardware speed — has many obvious advantages over consecutive programming. The goal is to organize the various asynchronous components which cooperate and(or) compete. Insofar as the algorithm is concerned, the system made up of asynchronous components is characterized by paralleleity and nondeterminism, The literature of concurrent programming is mostly recent and sparse. The goal of the article is to summarize this literature to acquaint the reader with current thoughts in this field. The following subjects are discussed: development of concurrent systems, theoretical problems of concurrent programming (definition of the process, relationships among processes, concept and role of the power source, coordinational problem categories, hazards emerging in the course of coordination), and devices supporting concurrent programming (synchronizing and coordinating devices) and their development. Special languages (such as CSP, Distributed Process, and ADA) were develcped to deal with the problems involved. References 13 Western.

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ELECTRONICS AND ELECTRICAL ENGINEERING HUNGARY

TYPE BK-300/N 300-CHANNEL CARRIER-FREQUENCY SYSTEM FOR SYMMETRICAL CABLE TRANSMISSION LINES

Budapest HIRADASTECHNIKA in Hungarian Vol 32 No 12, 1981 pp 461-468

PORPACZY, ELEMER, graduate electrical engineer, design engineer, TERTA [Telephone Factory]

[Abstract] The BK-300/N system can transmit 300 telephone channels over four-wire, separate-frequency, cables. The strand diameter is 0.9 mm Cu, 38.5 nF/km, the transmission is of the two-wire type. The multiplex systems up to the primary group are those conventionally used in systems with more (up to 2700) channels. The line frequency band of the system has five primary groups from the 312-1548 kHz band. The line section devices are of three main types: KEK-300/N combined amplifier frame, NBK-300/N remotely powered,remotely monitored amplifier, and auxiliary devices (portable power supply and telephone, and crosstalk-attenuating coil). There are two types of terminal, differing in the frequency range they handle. Remote supply is via the phantom circuitry of carrier-frequency circuits. The nominal distance between the amplifier stations is 1830 m. The system is protected against overvoltage and high-voltage interference. The devices of the terminal and the supervisory central station are supplied from the AC network or a central DC supply. The remotely supplied amplifiers are housed in corrosion-reststant steel casings. The major subassemblies (terminal (KEK-300/N), line termination module (VVB-300/N), line-transformer module (VTB), fault localizer module (HB-4), the service module (SB-3), remote-supply module (TTE-300/N), and remotely supplied and remotely monitored amplifier (NBK-300/N)) are described. The system and the devices are illustrated with circuit diagrams and specification charts. Figures 10.

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TECHNOLOGICAL ASPECTS OF DESIGNING MULTILAYER PRINTED CIRCUITS

Budapest FINOMMECHANIKA MIKROTECHNIKA in Hungarian Vol 20 No 11, Nov 81
pp 330-333

TOTH, ENDRE, associate professor, Department of Electronic Technology,
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[Abstract] The factors to be considered for achieving the primary requirements imposed on multilayer printed circuits are briefly discussed. In large-scale manufacture, the dimensional accuracy and stability of the film is highly important. Another important factor is the accuracy and stability of the laminations relative to each other. The means to achieve these goals depends on the composition of the substrates and on whether drilled holes are provided on the circuit board. The manufacturing steps of a four-layer printed circuit board without drilled holes, including a copper layer, was described to illustrate the considerations involved. Difficulties can arise in the galvanization process from the fact that the current-density distribution is not uniform (for example, in some individual, thin conductor paths the current density is likely to be much over the average). To some extent this can be compensated by proper designing of the printed circuit. Heat sinks and cold joints must be scupulously avoided. Most of the factors required to eliminate these hazards must be considered when preparing the circuit documentation which comprises the technological parameters of the materials used, the configuration of the circuit, and the properties of the substrate. Figures 9, referemces 2: 1 Hungarian and 1 Western.

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